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CHEMICAL TESTS FOR INTOXICATION —SCIENTIFIC BACKGROUND AND PUBLIC ACCEPTANCE

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Last summer while relaxing at a major league baseball game I was impressed by the huge happy crowd of men, women and children who filled the stands to capacity. Then when the announcement was made that the attendance was about 40,000, I suddenly realized the enormity of the prediction of the National Safety Council that 40,000 people would lose their lives in the United States in 1956 because of automobile accidents. My troubled thoughts then visualized an atomic bomb dropped on the field, killing outright every one of these life-loving people and severly injuring the rest of the million people of the entire county. I could see the headlines: "Greatest Calamity Since the Flood!" "Immediate Retaliation!" "The Enemy Must be Crushed!" and then my thoughts returned to the reality that the annual slaughter of 40,000 and the maiming of a million or so represented casual events involving a mere hundred or so killed each day and 3,000 injured by the automobile with such monotonous and predictable regularity that the events passed almost unnoticed. This complacent attitude might be comforting if these accidents were really unavoidable. But are they? Many independent surveys, have been made to determine the factors affecting motor vehicle accidents and usually *speed* has been regarded as the chief culprit. The drinking driver was considered to be an unimportant factor because up to about 1930 he was reported as being responsible for only one percent of fatal accidents. About that time I analyzed 119 accidents involving injury or death to more than 300 persons and found that the drinking driver or pedestrian was involved in half of the accidents and in one-third of these accidents the responsible individual was definitely intoxicated. Similar surveys made in various cities indicate that the same pattern exists at the present time. It is, of course, impossible to state that the alcohol was responsible for exactly half of the accidents, but it has been shown that alcohol increases the chance of having an accident, so that the harboring of about three ounces of alcohol in your body increases your chance of having an accident, by more than 1,000 percent. Now to return to a happier thought regarding the atomic bomb and the automobile carnage. If alcohol could be divorced from driving, possibly half of our 40,000 people doomed to die each year could live and half a million could be spared from painful and crippling injuries.

Thirty years ago I became curious concerning the relationship of some of the factors in traffic accidents including alcohol. It was not surprising that non-alcohol accidents followed the volume of traffic and reached their peaks between six and seven o'clock in the evening. However, the alcohol accidents exceeded the expected number based on the volume of traffic at three in the afternoon (after the cocktail hour), at seven in the evening (after the dinner drinks) and at midnight (after the parties). From midnight to five in the morning all of the accidents studied were concerned with alcohol, and again the number of these accidents greatly exceeded the expected number from the volume of traffic, which had reached its lowest ebb at this period. When the accidents were studied regarding the day of the week it was found that the week ends were the most dangerous times. On Saturdays and Sundays the alcohol accidents greatly exceeded the expected number based on traffic volume. These findings have been confirmd right up to the present time. The solution to the problem seemed obvious: Educate the automobile drivers and punish those who refuse to learn. Fortunately I was unaware of the difficulties before me. When the police called upon me to examine an obvious drunk, I cheerfully examined a man whose condition would have been recognized by a child. Then, at a later time I was called to court to testify as to my findings. The details still rankle, but this is what happened as taken from the court records:

> Attorney for the Defense: "Doctor, did you say that my client staggered when you examined him on January 1?"
> Answer: "Yes."
> Question: "Did that prove that he was intoxicated?"
> Answer: "No, that was just one of many symptoms."
> Question: "Doctor, is there anything besides alcohol that might cause staggering?"
> Answer: "Yes."
> Question: "Will you name some of these conditions."
> Answer: "A blow on the head, a tumor of the brain, multiple sclerosis and many more."
> Attorney: "Then there are many conditions besides alcohol that can cause the abnormalities you have described."
> Answer: "Yes."

He then proceeded to have me admit that all of the symptoms of intoxication could have been duplicated by conditions other than the effects of alcohol. Then he propounded his coup de grace: "Doctor, now consider all of the symptoms that you have been telling us about, his gait, coordination, balance, his speech, his appearance; could such findings have been caused by some condition other than alcohol?"

Answer (reluctantly): "Yes." (At the time, I was unaware that there were at least a hundred ailments that might produce symptoms resembling those of alcoholic intoxication). And then I made the mistake of staying in the courtroom while the attorney for the defense made his final plea. Take my advice. Get out of the courtroom when you can. This is what I heard: "Ladies and Gentlemen of the Jury. You have heard this doctor testify that my client was intoxicated on the night of January 1. And when I asked this doctor whether he knew of **any symptom** of intoxication he couldn't name **one single symptom.** And he had to admit that everything that he said about my client was probably due to some illness. And now, ladies and gentlemen of the Jury, having heard this doctor testify, I leave it to you. Who on the night of January the first was under the influence of alcohol, this client of mine, or this doctor!" The verdict: "Not guilty. Costs on the County."

After this experience, I refused to examine persons suspected of being drunk, particularly since I had learned that "ordor of alcohol on the breath" was not proof of drinking alcohol. Alcohol in the concentrations which occur in the breath has no odor. What we smell is the flavor of the drink—and when pure alcohol is drunk, there is no tell-tale odor. However, when I learned of the work of Nicloux, Southgate and Carter, who had correlated symptoms of intoxication with chemical tests of the blood and urine, I hesitatingly requested some of my friends to drink liquor and then let me observe them and perform chemical tests. When I explained that the Fayette County, Pennsylvania, officials had turned over a supply of confiscated liquor "just off the boat" they volunteered to act as guinea pigs, purely for the sake of science, of course. The experiments indicated that one or two stiff drinks could produce a blood alcohol percentage of 0.02 and measurable loss of judgment and self-control occurred. When more than 0.05 percent accumulated in the blood the effects of alcohol became more evident and coordination began to be affected. Knowing that my findings would be challenged I persuaded five people to drink and drive so that I could observe the effects of alcohol under actual driving conditions. I was surprised to observe that ordinary driving was so mechanical that relatively few errors were made. However, errors of judgment and coordination and increased reaction time became evident when obstacles had to be avoided, and the greatest change produced by alcohol occurred when the subjects tried to back the car. This being a less practiced maneuver was also the most difficult. One of my subjects had been driving fairly well in spite of a blood alcohol of 0.10 percent. When he had driven

to the limit of the practice area, which should have been closed to other traffic by the police, a truck passed the barricade and bore down upon us just as my subject was blissfully making a left turn in the path of the truck. Fortunately the truck driver swerved just in time and when I had recovered my breath I spoke to my subject. "Bob, wasn't that a close shave with that truck!" I'll never forget the expression on Bob's face, or, rather the lack of expression, when he said "What truck?" This episode terminated this type of test as can well be imagined. Regarding the mechanical side of driving, a man who believed he could drive better after a wet evening, told me that he remembers leaving Pittsburgh in his car after a drinking party and then remembers nothing until he awoke in his bed on the following morning. He had succeeded in driving fifty miles over country roads and through towns without knowing how he did it. I shudder when I think what might have happened if he had met his twin coming the other way.

When sufficient experience was obtained to learn that certain levels of blood alcohol were incompatible with safe driving, I was ready to meet my tormentors in court on even terms. The results were gratifying in that it was now simply a matter of proving that the accused, in spite of his "two glasses of beer," had in his body the equivalent of possibly a gallon or more, and that the percentage of alcohol in his body fluids was sufficient to materially affect his driving ability. Whereas previously a drunken driver was rarely found guilty, the conviction rate jumped to almost 100 percent when chemistry came to the rescue.

You could drive a car with a patch over one eye, one arm in a sling, one leg in a cast, and your head in the clouds, but you would admit that these handicaps might interfere with your driving ability to such an extent that your chance of having an accident would be greatly increased. However, many persons firmly believe that because they don't run into a hydrant as soon as they drive with a few drinks under their belts, and have actually negotiated long trips in spite of a load of alcohol, that alcohol does not affect their driving; and some will argue that they drive better when they are well oiled. This attitude was expressed by the same man who had driven fifty miles without remembering the event who said, "I know I'm a better driver when I'm a wee bit plastered because then I can drive nearer to cars coming the other way and also nearer to the ditch at the side of the road." The fallacy of this point of view lies in his inability to comprehend what alcohol does to his brain, and how could he judge his impaired ability, when alcohol first of all benumbs the brain so that judgment is impaired, and particularly, reduces the ability for self-criticism. If

the alcohol in the brain mounts still further, his eyesight is affected, coordination is impaired so that the sober onlooker would not need a chemical test to convince him that the fellow was drunk. However, the drunk himself would be so sure of his ability that he would probably, while trying to steady the swaying landscape, express himself, "Don't bosher me, I'm all right!" but to his companion he remarks, "Shay you've had enough now. You're getting all fuzzhy."

In order to understand how alcohol affects the brain, it is important to know that the bulge above the eyes, which is not shared with animals, consists of highly specialized nerve cells, where we have not only the seat of intelligence, judgment, conscience, moral sense, imagination and reason, but also the capital of government for self-control and inhibitions. This part of the brain is the last to be developed and is also the first to be effected by alcohol. This is the center for civilization, for here we have an organ which is capable of distinguishing between right and wrong, and which presides over the animal body, so that the appetites, emotions and passions can be controlled. It is evident then that when alcohol depresses the human characteristics, the animal functions come to the front. After a few drinks the very proper young girl says no but with a rising inflexion, and her escort forgets his Sunday School lessons. These changes take place before there is visible evidence of intoxication and it is only when the more primitive parts of the brain, for example, those which control coordination, are affected, does the individual's condition become obvious. Even these visible signs may quickly, though temporarily, be erased when he is stimulated by the shock of an accident or by contact with the police. Many a person has given the impression of being perfectly normal while under scrutiny, only to be dead drunk when the stimulation had passed. I will never forget the experience of examining a man who had been arrested as being an intoxicated driver. He was well dressed, courteous and cooperative. My examination revealed no evidence of intoxication and he almost too willingly gave me a specimen of his urine. When I had finished writing a favorable report regarding his condition, this man who had just passed his examination was lying on a couch—unconscious. Efforts to awaken him failed and he had to be carried away on a stretcher. When the alcohol rises beyond the level needed to destroy judgment and coordination, the most primitive part of the brain is affected and then even basic functions such as breathing are affected and the person dies of asphyxiation. Alcohol acts like an anesthetic. A feeling of warmth, freedom from worry and responsibility may be associated with a conviction of mental

superiority. I, myself, succeedeed in solving the secret of the universe while "experimenting" with alcohol. This condition was known to a German scientist years ago. Schmiederberg, about 1882, wrote, "One is often astounded at the ease with which he expresses his thoughts, and with the keenness of his judgment in matters which are beyond his mental sphere when sober, and may later have reason to be ashamed of this delusion." Alcohol, like other anesthetics, causes decreased nerve conduction so that impulses from the brain to the muscles may be blocked. The drinker then, not being able to control his coordination, may feel that he is detached from his body and from a safe distance looks with amusement and amazement at his own antics.

The effects of alcohol on the brain resemble those of asphyxiation. The aviator flying at high altitudes having a feeling that his brain is functioning unusually well, while his judgment and the control of his body are decreasing, dreams he is flying his plane perfectly while he is blacking out and the ship is going into a downward spiral. I can speak from personal experience regarding asphyxiation. While trying to break an under-water swimming record the desire to breathe was controlled as long as possible. Then I remember as a vivid dream my surprise and pride over my clear head and the powerful strokes which propelled me to the edge of the pool. Then came the climax of strength. Whereas ordinarily I would have climbed from the pool by the laborious method of pulling myself up with my hands, this time with the greatest of ease I simply stepped up and, as I thought, walked out of the pool. Later I learned what had really happened. Two men had rescued the floundering swimmer and dragged me to the edge of the pool where other men pulled me out of the water and deposited the heap on "dry land."

Committees of the National Safety Council and the American Medical Association have recommended:

> (1) If the blood contains 0.05 percent of alcohol by weight, it shall be presumed that the defendant was not under the influence of intoxicating liquor and should not be prosecuted on the charge.
>
> (2) If the blood contains in excess of 0.05 percent but less than 0.15 percent of alcohol, such fact shall not give rise to any presumption of guilt or innocence, but should be considered with other competent evidence. It must be emphasized however that the recommendations should not be interpreted that 0.15 percent is the dividing line between drunkenness and sobriety.
>
> (3) If the blood contains 0.15 percent alcohol or more, it shall be presumed that the defendant was under the influence of alcohol. The defendant still has the opportunity to

> present competent evidence to prove his innocence and it remains for the court or jury to pass on his guilt or innocence. This figure is obviously too generous; driving ability has been impaired to a significant degree long before 0.15 percent is reached. In fact, Bjerver and Goldberg, of Sweden, recently tested thirty-seven skilled and experienced drivers, most of them accustomed to drinking moderate amounts of alcohol, and found that all of them showed impairment in their driving ability w hen the alcohol in the blood was between .035 and .04 percent. A definite impairment of vision occurred in all individuals when the blood alcohol reached concentrations between .02 and .03 percent.

Twenty-three states have adopted legislation which embodies these recommendations although a statute is actually unnecessary in order to make use of chemical tests. The purpose of the statute is to facilitate the legal admissibility of the evidence. New York, Kansas and Idaho have gone one step further and have made chemical tests mandatory when requested by the police, and failure to comply with the request to be automatically followed by revocation of the driver's license of the accused. Such procedures are often characterized as infringements upon a person's legal rights against self-incrimination. However, Supreme Court decisions have indicated that self-incrimination refers to verbal utterances and not to evidence obtained by the examination of urine, blood or breath given without compulsion. In this way the evidence of a chemical examination has the same legal status as evidence obtained from the examination of finger prints and foot prints.

For some years there has been considerable concern over the differences of opinion of various persons regarding a diagnosis of alcoholic intoxication. One experienced examiner considered a person to be under the influence when only psychcologic abnormalities were found, while another considered a man sober as long as he could stand, walk and talk. Such disagreements could be reconciled if the 1935 decision of the Supreme Court of Arizona were adopted by all examiners:

> "The expression, under the influence of intoxicating liquor, covers not only all the well-known and easily recognized conditions and degrees of intoxication but any abnormal mental or physical condition which is the result of indulging in any degree in intoxicating liquors and which tends to deprive him of the clearness of intellect and control of himself which he would otherwise possess. If the ability of the driver of an automobile has been lessened in the slightest degree by the use of intoxicating liquors, then the driver is deemed to be under the influence of intoxicating liquor. The mere fact that the driver has taken a drink does not place him under the ban of the statute unless such drink has some

> influence upon him, lessening in some degree his ability to handle said automobile."[1]

In retrospect, whereas alcohol is the greatest single factor in automobile accidents, the legal proof of alcoholic intoxication is extremely difficult, and often impossible. When chemical tests are used, the evidence can be used to convict the guilty and absolve the innocent. Also, many lives have been lost when persons with fractured skulls or diabetic coma were put in jail to sober up when chemical tests might have saved their lives by suggesting proper treatment.

[1] Steffani v. State, 45 Ariz. 210 at 212, 42 P.2d 615, at 618 (1935).

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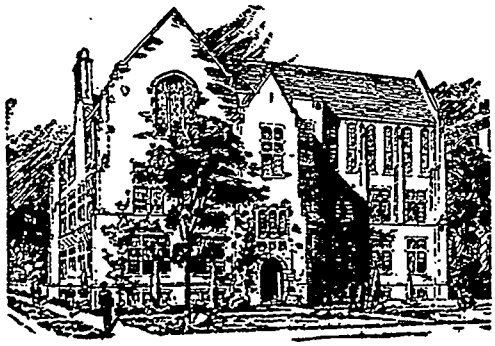

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